REMARKS

In response to the above-identified Office Action, Applicants amend the application and seek reconsideration thereof. In this response, Applicants amend Claims 1 and 11 and cancel Claims 4 and 13. Applicants add new Claim 20 and 21. Support for the new claims may be found, for example, at page 21, lines 1-16 of Applicants' specification. Accordingly, Claims 1-3, 5-12, and 14-21 are pending.

I. Claims Rejected Under 35 U.S.C. § 102

Claims 1-19 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,526,083 issued to Kneissl et al ("Kneissl"). Applicants respectfully traverse the rejection.

To anticipate a claim, the Examiner must show that a single reference teaches each of the elements of that claim. Among other elements, amended Claim 1 recites "wherein the light absorption layer is depleted by polarization and a p-n junction built-in voltage." Applicants submit that Kneissl does not teach at least this element.

The Examiner characterizes Kneissl's active region 108 as the light absorption layer recited in Claim 1. However, Kneissl does not disclose that the light absorption layer may be depleted by polarization and a p-n junction built-in voltage. Rather, Kneissl discloses two basic modes of modulation (col. 8, lines 57-58). The first mode, called the "forward current modulation mode," involves supplying a current to an amplifier region and a modulator region when a forward bias is applied to the amplifier region (col. 8, lines 5-9 and 59-63). The second mode, called the "reverse bias modulation mode," involves applying a reverse bias to the modulator region (col. 8, lines 10-11 and col. 9, lines 14-17). Thus, the two modes disclosed by Kneissl require either applying a current in the presence of a forward bias or applying a reverse bias to the modulator region. By contrast, the modulator of amended Claim is capable of modulating by depleting the absorption layer with polarization and a p-n junction built-in voltage. Thus, modulation is made possible without applying a reverse voltage or injecting any current.

As described in Applicants' Specification at page 10, carriers in practice exist in the light absorption layer. Without applying a reverse bias voltage, the light absorption layer cannot be completely depleted if only the p-n junction built-in voltage is present. The claimed light absorption layer is depleted completely in an unbiased state by both the polarization and the p-n junction built-in voltage. Kneissl does not disclose using both the polarization and the p-n junction built-in voltage to completely deplete the light absorption layer. Thus, Kneissl does not teach each of the elements of amended Claim 1. Accordingly, reconsideration and withdrawal of the anticipation rejection of Claim 1 are requested.

Analogous discussion applies to Claim 11. In regard to Claims 2, 3, 5-10, 12, 14-19, these claims respectively depend from independent Claims 1 and 11 and incorporate the limitations thereof. Thus, at least for the reasons mentioned above in regard to Claims 1 and 11, Kneissl does not anticipate these dependent claims. Accordingly, reconsideration and withdrawal of the anticipation rejection of Claims 1-3, 5-12, and 14-19 are respectfully requested.

Moreover, with respect to Claims 10 and 19, the Examiner relies on Kneissl for teaching the claimed quantum-well layer comprising GaN. Kneissl discloses a quantum well layer comprising InGaN. The Examiner asserts that GaN may be derived from changing a lattice constant of the InGaN, and the lattice constant may be changed by changing a mixed crystal ratio. In InGaN, the phase separation, as well-known in the art, occurs in a wide composition region. When a phase separation occurs, a quantum dot-like constitution will be made in a light absorption layer, and the bandgap of the light absorption layer will change locally. In a light-emitting element, the high-efficiency emission of light is used in a dot-like region. By contrast, since InN is a compound unlike InGaN which is a mixed crystal, a phase separation cannot occur. Therefore, a uniform bandgap is provided, absorption is caused in all of the regions of the absorption layer, and the device characteristic improves. Thus, Claims 10 and 19 are not anticipated by Kneissl at least for this additional reason.

CONCLUSION

In view of the foregoing, it is believed that all claims now are now in condition for allowance and such action is earnestly solicited at the earliest possible date. If there are any additional fees due in connection with the filing of this response, please charge those fees to our Deposit Account No. 02-2666. If the Examiner believes that a telephone conference would be useful in moving the application forward to allowance, the Examiner is encouraged to contact the undersigned at (310) 207 3800.

Respectfully submitted,

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CERTIFICATE OF MAILING:

I hereby certify that this correspondence is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Erin Flynn November 16, 2005